

## WESTERN NATURE STUDIES

By J. H. PAUL.  
FOUR MARVELS OF INSECT LIFE.

FIG. 227.



FIG. 228.

FIG. 229.

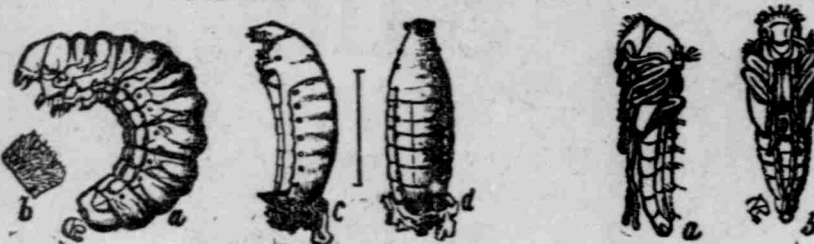


FIG. 230.

FIG. 231.

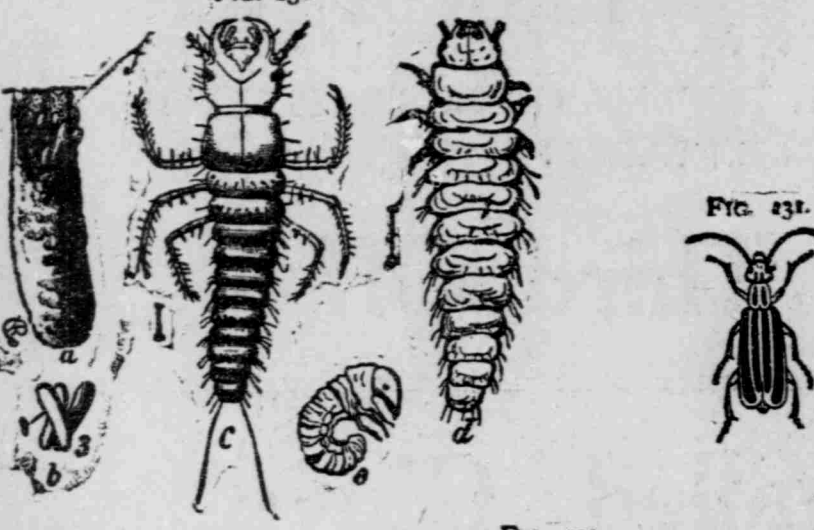
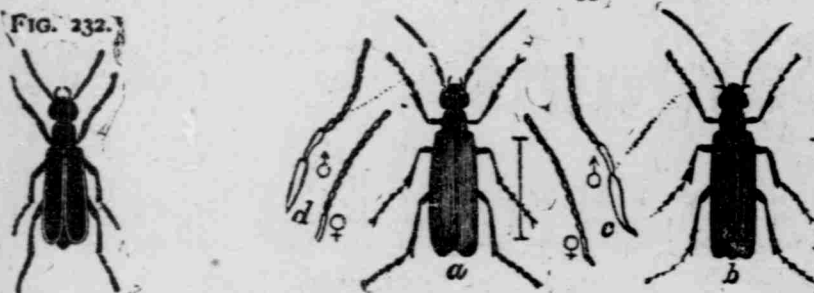


FIG. 232.



At the top are the "Spanish fly" blister beetles feeding on leaves; then different stages of the larvae of blister beetles while in the cell of the ground bee or the grasshopper egg-sac; next are enlarged pictures of the triungulin, also the grasshopper egg-sac at the left and a striped blister beetle at the right. At the bottom are three blister beetles and their antennae, or feelers, magnified—the organs of the highly developed sense of smell in the burying beetles.

## I.—The Transformations of the Triungulin.

The beetle lectures of Professor Titus before the writer's classes in nature study at the university have covered so much interesting matter that selections from them, rewritten to meet a variety of tastes, may occupy several articles.

Among the flowers of the wild aster and other composite species may be found active little creatures with large heads, long legs and prominent jaws. They are rather ugly for such tiny beasts, being only about one-fourth of an inch in length. These larvae are called the "triungulins." Strangely enough, they are not eating the flowers of the aster or golden-rods in which

they now live, because they do not feed on vegetation. They are carnivorous, though they come from the eggs of beetles that feed on potatoes, beets and other field crops, or on the heads of the various asters and other similar flowers. Without its proper food, the triungulin simply fasts and bides its time. It seems to know exactly what to do in this situation, and does not leave the flower head in search of nutriment.

## The Bee-Pollen Feeders.

The beetles that lay the eggs from which the little triungulins emerge are of two general types—the bee-pollen feeders and the grasshopper-egg feeders. The life histories of these beetles are among the strangest that occur in all the insect world. The vagaries of fiction, the legends of mythology and the odd fancies in fairy tales and folk-lore are all outranked in romance, mystery and wonder by the simple facts in the life histories of the blister beetles. The little demon or fairy called the triungulin (for it is merely a matter of mental or emotional attitude as to which term you apply to the tiny creature) runs about among the aster flowers without feeding. He takes no food at this time, but waits for the appearance of the winged angel that is to transport him to a "land flowing with milk and honey." For he is a mere stranger and sojourner amid forests of the golden-rod or aster, despite the fact that the parent beetle, living in a sphere far removed from his experience, has placed him there. A tiny moth visits the flower in search of nectar; the triungulin pays no attention to it. An ant crawls across the flower head, picking out a seed for its granary; still the larva heeds not—he is waiting for the parent bee to come along and then he will act with unerring promptness and certainty. Presently one of the ground bees comes busily buzzing to the aster in search of honey for itself and of pollen for its future progeny; as it does so, the triungulin, knowing by some incomprehensible instinct that his deliverer has at length arrived, gets busy, too. As the bee creeps over the flower head, crouching up the golden pollen dust with her long body parts, the larva seizes one of the legs, usually the hairy hind leg, and secures a firm hold upon this fuzzy member of the strong-winged flier. Laden with honey and pollen, and also with the triungulin, which is clinging securely to her foot, away flies the worker on a bee life to her home—a cell in the earth far distant perhaps from the scene of her labors among the blossoms which she has just been for nectar and bee bread. For this bee digs a hole in the ground, and lays her eggs therein. First she puts a layer of the pollen, or larval food, at the bottom; then on this prepared pollen she lays an egg.

She may spread over the first egg another layer of pollen, then lay another egg, and so on. As soon as the triungulin larva is carried to the bottom of the cell, it lets go of the bee's leg and that has been deposited on the pollen stored there. Then the larva, thus nourished, soon changes into a stage without feet. Strange to say, it is now a vegetable feeder, and proceeds at once to feed upon the stored bee bread that was intended for the young bee. But the egg having been devoured by the larva of the blister beetle, the latter now devours its intended food. It is now a herbivorous creature. Previously it was carnivorous. Now it resembles the larva of the June beetle, the white grub; also a vegetable feeder; and now, like the latter, it wriggles along on its back, since it cannot walk. In the cozy house built for the young bee it passes the winter. The next spring it emerges as an adult beetle.

## The Grasshopper-Egg Feeders.

In the second kind, called the grasshopper-egg feeders, the eggs of the beetle are laid mostly on the ground. When hatched, these larvae run about searching for indications of grasshopper egg-pouches. And though the female grasshopper, after having laid

her eggs in a sac in the ground, is always exposed to the attacks of many known group that greatly damages beets and other crops. They belong to the Heteromera, or beetles with mixed tarsi. The first and second pairs of legs have five-jointed, and the third four-jointed tarsi—a structural difference that distinguishes the group from all others. Of this group the commonest are the blister beetles, so named because the juices of their bodies will quickly raise a blister if applied to the skin of the arm or face. It is a large tropical beetle of Mexico and elsewhere, that furnishes the caustic, or "Spanish fly," of commerce, for making hot lotions and raising blisters. Their wings slope over and cover their bodies, which are mostly narrow. They are voracious feeders on vegetation of many kinds, though their original abode was perhaps the aster and other composite flowers, which they still favor. They go in for the larvae of some species, developing from eggs laid in the ground, feed on the eggs of grasshoppers, they thereby do so much good that it is hard to say whether this particular blister group is injurious or beneficial. But when any of the species appear in swarms they should be destroyed. Before the advent of the Colorado beetle in 1865, the striped blister beetle was considered the most destructive potato pest of the east. The three-lined and the spotted blister beetle are other pests important in the west. Paris green, applied dry or as a spray, is the remedy.

On most of our salt bushes a small beetle may be found feeding. The introduction of the sugar beet has induced it to desert the salt bushes in favor of the beet leaves. Ours resembles the eastern elm-leaf beetle, but is larger; it is oblong, narrow in front, and dull brown in color, with striped

Walker's Two great Christmas sales Walker's  
One of black silks, one in ready-to-wear

## Our Annual Christmas sale of black silks begins Monday morning.

It's one of the events looked forward to by gift seekers as an opportunity to secure a splendid, handsome, acceptable gift at a welcome saving—

The range offered this season for selection is unlimited. Every yard of black silks in the entire department reduced—prices all hover around the half mark. It's our bravest offer. It is far-reaching and will prove an irresistible attraction to those who want black silks—especially for Xmas gifts.

A few quoted give an idea; many others in the department to interest you.

- 18-inch taffeta, beautiful luster, a very fine 85c quality; 750 yards in the lot. Christmas sale price..... 49c
- 27-inch taffeta, will not crack, elegant 95c grade; 300 yards of this to go at the Christmas mas sale price..... 56c
- 27-inch taffeta, very high class, beautifully finished fabric; our \$1.30 selling quality; 600 yards of this; Christmas sale price..... 87c
- 30-inch taffeta, especially strong, excellent \$1.45 value; 350 yards to go at the Christmas sale price..... 94c
- 36-inch taffeta, noted for its finish and durability, our recognized \$1.75 grade; 450 yards of this at the Christmas sale price..... \$1.17
- 36-inch Phalanx taffeta, a recognized leader at \$2.25 the yard; 400 yards offered at the Christmas sale price..... \$1.33
- 36-inch Bonnet taffeta, a world renowned \$2.25 value; 300 yards of this; Christmas sale price..... \$1.52
- 36-inch Walker Bros' "Special" taffeta, oil boiled quality, elegant Liberty finish; made for us to sell at \$2.50 the yard; 350 yards in stock to go at the Christmas sale price..... \$1.57
- Beautiful satin messaline, soft and lustrous, splendid wearing, \$1.25 grade; 200 yards marked down to the Christmas sale price..... 87c
- Elegant satin paillette, made by C. J. Bonnet, rich Liberty finish, excellent draping qualities, to sell at \$1.60; 250 yards we offer at the Christmas sale price..... \$1.15
- Beautiful satin souple, a new weave, light and durable, very high luster, worth \$1.75 the yard; 300 yards to go at the Christmas sale price..... \$1.19
- Rich messaline, a very popular number, excellent \$2.50 grade; 250 yards in the lot; Christmas sale price..... \$1.49
- 36-inch Sultana, one of C. J. Bonnet's finest productions, beautiful finish and an excellent draping fabric; worth \$3.25 the yard; 200 yards of this to go at the Christmas sale price..... \$1.95

Our regular \$1.75 Ottoman silk, very soft and lustrous; 150 yards in the line; Christmas sale price..... \$1.14

Crystal Ottoman, irregular finish, very new, a superior \$2.75 grade; 200 yards to go at the Christmas sale price..... \$1.67

No approvals, no exchanges—no credits on returned silks.

## Great Christmas sale in the ready-to-wear section

Evening coats, capes, gowns and dresses—walking and dress skirts, tailored suits, winter coats and our entire line of furs at unusually attractive Christmas reductions.

Our entire line of evening coats and capes—in elegant broadcloths and Duchesse satins, with genuine Skinner and Duchesse satin. Dainty pastel shades of light blue, rose, pink, Edison blue and 1/3 off \$75.00 each. Choose at .....

Evening gowns—about forty-five beautiful creations, most elegant models, fabrics are satins, messalines, crepes, taffetas and broadcloths. Marked regularly at \$25.00 to \$250.00 each. Choose next week at 1/2 Prices

Neat tailored suits—made of fine chiffon broadcloth, velvets and imported worsteds, embracing beautiful high colorings and black, trimmed effectively with braids and buttons. A hundred in this splendid lot. Worth \$35.00 to \$125.00 each. Choose next week at 1/2 Prices

A beautiful line of skirts for dress occasions and street wear, newest models, neatly tailored, made of fine broadcloths, fancy novelty fabrics and Panamas; blacks, blues, browns and mixtures; values range from \$10.00 to \$25.00 each; choose at 1/2 Prices exactly.....

A handsome line of winter coats—sizes for misses and women. Fine kerseys, meltons and coverts—seven-eighths and full length. Semi-fitted and Empire models. Colors are black, blue, green and mixtures. The entire line reduced one-third, as follows:

- \$9.00 coats reduced to ..... \$6.00
- \$12.00 coats reduced to ..... \$8.00
- \$15.00 coats reduced to ..... \$10.00
- \$22.50 coats reduced to ..... \$15.00
- \$30.00 coats reduced to ..... \$20.00

## Our entire line of beautiful furs, including muffs, neck pieces and coats reduced 25 per cent

Including the very best furs used in garment manufacturing. There are beautiful specimens of eastern mink, ermine, black lynx, Jap mink, Kolinsky and natural and blended squirrel—prices reduced one-fourth—these for example:

- \$125.00 pieces; Christmas price... \$93.75
- \$85.00 pieces; Christmas price... \$63.75
- \$75.00 pieces; Christmas price... \$56.25
- \$60.00 pieces; Christmas price... \$45.00
- \$35.00 pieces; Christmas price... \$26.25
- \$20.00 pieces; Christmas price... \$15.00
- \$12.00 pieces; Christmas price... \$8.00
- \$10.00 pieces; Christmas price... \$7.50

No exchanges, no approvals on sale goods. No credits allowed on returned merchandise.



Our \$1.75 Boys' Shoe is a prize. So parents think who have been buying them for their boys.

We selected good Box Calf for these Shoes, had them double-soled and strongly made. Looked after all the little details in making and sell them for the reasonable price of—

- Sizes 9 to 13 ..... \$1.25
- Sizes 13 to 2 ..... \$1.50
- Sizes 2 1/2 to 5 ..... \$1.75

Somebody, somewhere, may be selling as good a Boys' Shoe for the same money, but we've yet to see it.

Christenson  
SHOES ARE BETTER

120 South Main Street.

DRINK  
**American Beauty Beer**  
A Mild and Refreshing Tonic.

Salt Lake City Brewing Company  
J. Moritz, Gen'l Mgr.  
Phones No. 17.

## II.—The Blister Makers.

The blister beetles comprise a well known group that greatly damages beets and other crops. They belong to the Heteromera, or beetles with mixed tarsi. The first and second pairs of legs have five-jointed, and the third four-jointed tarsi—a structural difference that distinguishes the group from all others. Of this group the commonest are the blister beetles, so named because the juices of their bodies will quickly raise a blister if applied to the skin of the arm or face. It is a large tropical beetle of Mexico and elsewhere, that furnishes the caustic, or "Spanish fly," of commerce, for making hot lotions and raising blisters. Their wings slope over and cover their bodies, which are mostly narrow. They are voracious feeders on vegetation of many kinds, though their original abode was perhaps the aster and other composite flowers, which they still favor. They go in for the larvae of some species, developing from eggs laid in the ground, feed on the eggs of grasshoppers, they thereby do so much good that it is hard to say whether this particular blister group is injurious or beneficial. But when any of the species appear in swarms they should be destroyed. Before the advent of the Colorado beetle in 1865, the striped blister beetle was considered the most destructive potato pest of the east. The three-lined and the spotted blister beetle are other pests important in the west. Paris green, applied dry or as a spray, is the remedy.

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## The Sextons and Death Watches.

Insect grave diggers and death watches—I trust that this heading may not suggest unpleasant fancies to any highly sensitive persons, especially teachers, for whose benefit these chapters were primarily intended. Whoever happens to honor these little essays with a casual, if suspicious and hurried reading may lay aside his prejudice against the six-legged legions. True, the insects themselves are, to most people, bad enough to contemplate, without the added element of weird and suggestive headlines. But they are herewith assured that the facts themselves make rather for life and cheerfulness. For the graves dug by the beetles are those of decaying animals, and the ticking of the so-called "death watch" is really a symptom of too much life in the sick chamber. It is merely the peculiar life history of these creatures that makes the use of such terms convenient.

In Mother Goose's rhymes, the beetle is associated with the ceremonies of interment in the tragical history, "Who Killed Cock Robin?" Thus: "Who'll make his shroud? 'I,' said the beetle, 'with my thread and needle.'"

But in nature the beetle takes the part attributed to the owl—"I'll dig his grave."

## III.—The Burying Beetles.

Some of the scavenger group are known as burying beetles. The species that have the habit of burying small dead animals are of two groups. The members of one of the groups that do this live entirely above ground and do

not purposely bury the animal. They will simply creep under any dead animal, say, a bird, to lay their eggs in it, and may partially bury the carcass in so doing. But others purposely cover up with soil the bodies of small dead animals which they find lying on the ground. Dead mice, gophers, prairie dogs, and even rabbits are speedily disposed of; and as these beetles are found almost everywhere, they constitute a most valuable group. They excavate beneath small dead animals, gradually sinking them below the surface level. In both types the larvae are black and flattened. Rove beetles are mostly small, long and narrow-shaped scavengers, with short wing covers, which leave half the abdomen exposed. They often occur in decaying fungi.

The carrion group perform a service especially important in temperate regions, but not so great in arid tropical countries, where dead animals quickly dry up and are less of a menace to health than in cooler climates, and here these beetles most plentifully abound. This useful group, which does much for human health in high altitudes, is distinguished by clavate or clubbed feelers. The antennae terminate in little knobs. We find them on any decaying animal matter, which they promptly proceed to eat or to bury. They do this for their own purpose; they lay their eggs in the carrion, so that the larvae may live on it. In all their life stages, they feed on decaying animal matter, and are therefore always useful. They have the sense of smell strongly developed, and are largely nocturnal in habits. Their activity in burying the food for their future larvae is truly wonderful.

## The Lesser Scavengers.

Distinctly related species are the small flatheads that get into pantries and in-  
fest flour and meal; the larger or bacon beetle, nearly half an inch long, that feeds on stored provisions, hides and

skins; the leather beetle, that does much damage in tanneries; the museum beetle, that attacks the hair and feathers of museum specimens. Bistifid of carbon is the remedy for the last; cleanliness and closed boxes for the other kinds.

The carpet beetle often gets under the edges of carpets and eats them full of holes; the best remedy is to go over the edge of the carpet, protected by a wet cloth, several times each season with a hot flatiron. The drug store beneath small dead animals, gradually sinking them below the surface level. In both types the larvae are black and flattened. Rove beetles are mostly small, long and narrow-shaped scavengers, with short wing covers, which leave half the abdomen exposed. They often occur in decaying fungi.

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THE ROYAL CAFE